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Paul Andersen explains how pigments can be separated using chromatography. Shows how to calculate the Rf value for each dye. It then explains how you can measure the rate of photosynthesis Lab Review Worksheet - Winnie Litten Lab 4 Plant Pigments & Carry Photosynthesis Introduction: The purpose of this laboratory experiment was to separate plant pigments using paper chromatography and measure photosynthesis rate in isolated chloroplasts. Due to the capillary action the solvent moves up the paper causing the pigments to become visible at certain distances. Substances visible on paper are called pigments. Chlorophyll a is the main pigment that makes up about 75% of pigmentation in plants. Chlorophyll b makes up about 25% of the pigment that make up the rest of the pigment. Carotene is the most soluble of the pigments and will therefore be transferred the furthest from the solvent. The paper will display a range of pigments found in spinach leaves. Using the Rf type one can determine the relationship between the distance forward migrated Light is a part of a continuous radiation or energy waves. Energy from visible light is used in the photosynthetic process. Light is absorbed into leaf pigments, the electrons within each photosystem are amplified to a higher energy level to produce ATP and reduce NADP and NADPH. ATP is then used to stabilize carbon. This is the incorporation of CO2 into organic molecules. A spectrophotometer will be used to measure the transmission of light to chloroplasts. The reason behind measuring the transmission of light is the calculation of the rate of photosynthesis in chloroplasts. A solution called DPIP will be used in place of NADP to judge the color change of chloroplasts are required to display light reactions. Hypothesis: In this experiment it is assumed that the cell with boiled chloroplasts and the cell that is kept in the dark and containing non-poachers exposed to light will have an ever higher transmission % over time. Materials and methods: Laboratory 4A: The materials in this part of the laboratory were: dithic, glass vial, small amount of solvent, a quarter, and spinach leaves. The first step was to cut a point at one end of the and flipped over with a quarter over the pencil line. This gives a green line over the point down to the bottom. When the point and then each pigment forehead in the vial, it was removed. The solvent front was then guickly marked with a pencil and then each pigment forehead was also marked. From the distance travelled by the distance travelled by the solvent was calculated the value Rf. Laboratory 4B: The materials used in this laboratory were: a spectrophotometer, 4 cuvettes, phosphate buffer, distilled water, boiling chloroplasts, non-oil chloroplasts, and DIP. First the cuvettes were marked 1-4 and cleaned with lens paper because even the oil from your hands can affect the transmission of light through the cell. Cuvette 2 was then wrapped in foil to keep the contents in the dark. Then add 1 ml of phosphate buffer solution to all four bunks, 4 ml of distilled water in cuvette 1, 3rn1 distilled water at 2,3 and 4, while Iml DPIP was added to 2,3 and 4. Then, 3 drops of nonrefueled chloroplasts were added to cuvette 1, covered with parafilm, placed in the spectrophotometer and set to 100% transmission. This cell was used to recalonation between readings as well. Three drops of untromanized chloroplasts were placed in cuvette 2 and 3, and three drops of boiled chloroplasts were placed in cuvette 4. The cuters were then covered with parafilm. Each was placed on the spectrophotometer and the % transmission of each was recorded every five minutes for 15 minutes. Data: Table 4.1 Questions: 1. Which dye migrated the most and why? Carotene, it was the most soluble and did not form links to the paper. 2. Which of the 2 types of chlorophyll is more soluble? Chlorophyll a 3. Why do leaves change color in autumn? The production of chlorophyll in the leaves is slowing down. 4. What is the function of chlorophyll in photosynthesis? They absorb red and blue rays of light. 5. What are the auxiliary pigments and what are their functions? Carotene and xanthophylls both absorb different wavelengths of light than chlorophyll does. 6. What are some other ways chromatography is used to separate plant pigments? There are three types: Column, Paper, and Thin Layer Chromatography. 7. What does value represent? The distance travelled by the solvent are expressed as a value. 8. What factors are involved in the separation of pigments? In this test Solubility, 9. Would you expect the Rf value of a dve to be the same if a different solvent was used? Explain, No, for a different solvent there would be a different solvent the solvent there would be a different solvent the solvent there would be a different there would be a different solvent the solvent there would be a different the solvent the solvent there would be a different to Fingerprints on either filter paper or cuvettes may have influenced the experiment, because the oil from your hands can get into these things and affect the results. The spectrophotometer may not have been calibrated correctly, because this was the first time this one was used. Other than that, there were few places for error in this lab. Conclusion: From laboratory 4a we discovered that the many pigments found in chloroplasts are all involved in collecting energy from sunlight. The real purpose of this was to observe the DPIP go from a blue color to a clear color. This showed that photosynthesis was happening and at what rate it was happening that the available amount of light has a very large effect on the rate of occurrence of light photosynthesis reactions. BACK Photosynthesis is a process used by plants and other organisms to convert light energy, usually from the Sun, into chemical energy that can be released later to fuel the activities of organisms. Friday, November 1 Went Over Breath Exams and Essays Discussion on the Thanksgiving Work Project - Read 8.0-8.3 (page: 165 - 176) Monday, November 4Th Tuesday, November 5th Teacher Work Day - NO SCHOOL!!! Wednesday, November 6Th Thursday, November 6Th Thursday, November 7th Reading Quiz Photosynthesis POGIL Work Edpuzzle Standard Deviation & 4: Plant Coloring and Photosynthesis Photosynthesis Photosynthesis Photosynthesis Lab Detailed Presentation Friday, November 8 Finish POGIL Standard Deviation Practice Work: Reading - Chapter 29.1-29.2, 29.5-29.7 (Pages: 603-609, 619-626) Edpuzzles Plant Nutrition and Transportation (Bozeman) Plant Structure and Adaptations - amoeba sisters AP Biology Lab 9: Breathing Tuesday, November 12 Plant Nutrition During the intervention we examined Elodea under the microscope (played with plasmolysis) Work: Edpuzzle Vascular Plants (Vascular Plants (Vascular Plants = Winning! - Crash Course Biology #37) Osmosis and Water Dynamic Bozeman - Water Dynamic Wednesday, November 13Th Creation Algae Miscrocopy Review in Tables Tops 6 Groups Organilla Structure (Mitochondria vs Chloroplast) ATP Composition Input/Exit Gallary Walk Discuss Differences/Similarities, evolution and of cell breathing and photosynthesis Algae Microscopy Make slides and take pictures Look at Elodea and / or wandering Jew under the microscope (by wandering Jew - we added water to see the stomat a a Thursday, November 14 Photosynthesis and Cellular Breathing Core Lab with BioRad Algae Balls Home Dehydrogenase Activity in chloroplast extracts - the DPIP laboratory (the light Color (red and green) Temperature (hot and cold) Ecosystem (2 snails per) Monday, November 18 Essay Quiz Online Breathing Lab Work on Lab Reports/Presentations Tuesday, November 20 Present in Laboratories Review table tops for test Work Thursday, November 21 Photosynthesis Test (Study Guide) mathematics can and may be related to average, standard deviation, percentage, and/or water potential Intro Photosynthesis and Light Reactions Calvin Cycle and C4/CAM plants: Things that do not currently use (Stop and Surface Instructions) Entire Plant Breathing Laboratory Page 2 Transfer Application, percentage, and/or water potential Intro Photosynthesis and Light Reactions Calvin Cycle and C4/CAM plants: previous semester, you do not need to fill out the form. Replies must be submitted by Thursday 14 January 2020. Page 3 Our School Academics Global School Fachnology Initiative Sports AoIT Club Parents Resources School/Staff- Container Aldridge, Joe Alward, Joshua Angie, Jennifer Anker, Andrew Appling, Jacob Austin, Melissa Austin, Rebecca Aylward, Cathy Ballard, Courtney Ballesteros, Diana Belfrom, Philip Blackburn, Lindsay Blackwell, Ashley Blocker, Laurie Borders, Kenya Brewington, Crystal Burgess, Lauren Byng, Robert Calton, Lori Campbell, Darren Carr, Rebecca Cauthen, Amanda Ceresa, Brian Chapman-Kennedy, Allison Church, Allison Cline, Marilyn Cocaro, Carly Conlan, Karen Cook, Jennifer Davanzo, Philip Dellinger, Crystal Dill, Cammy Dillon, Christina Ellie, Eric Fontan, Mary Fort, Michael Coller, Chelsea Lamberty, Lisa Landon, Lisa Landon, Lisa Landon, Lisa Landon, Lisa Landon, Lindsay Het, John Hunter, Deborah Hudson, Molly Johnson, Tyler Kelly, Michael Coller, Chelsea Lamberty, Lisa Landon, Lisa Landon, Lisa Landon, Lindsay Het, John Hunter, Deborah Hudson, Molly Johnson, Tyler Kelly, Michael Coller, Chelsea Lamberty, Lisa Landon, Lisa Landon, Lisa Landon, Lindsay Het, John Hunter, Deborah Hudson, Molly Johnson, Tyler Kelly, Michael Coller, Chelsea Lamberty, Lisa Landon, Lisa Landon, Lisa Landon, Lisa Landon, Lindsay Het, John Hunter, Deborah Hudson, Molly Johnson, Tyler Kelly, Michael Coller, Chelsea Lamberty, Lisa Landon, Lis Lipham, Courtney Lobo Plaza, Gerardo Macomber, Ryan Marrara, Allison Martin, Tena Mathews, Helen McClure, Molly McTique, Patricia Milliken, Joan Molina, Jessica Mullen, Leah Myers, Joyce Nichols, Jennifer Parker, Jessica Peterson, Jeremy Pierrot, Kellie Pitts, Benjamin Powell, Karen Ramsey, Tiffany Redmond, Travis Ripper, Jennifer Rivera Dones, Maria Schields, Jessica Schoch, Heather Shafer, Nancy Sheets, Matthew Sherman, Alfreda Shuping, Susan Singer, Adam Smith, Rachel Sallings, Veronica Sturgies, Anita Tate, Noah Taylor, Charlotte Taylor, Erin Brown, Delette Buchholz, Leahh JR Cotten, Lerlean Dixon, Leatrice Imburgia, John Milam, Anne Shive, Jason Smith, Smith,

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